

Notice of Allowability

Application No.

09/936,065

Examiner

Krishnan S Menon

Applicant(s)

DEMMER ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment of 11/10/03.
2. ☒ The allowed claim(s) is/are 1 and 3-17; RENUMBERED 1-16.
3. ☒ The drawings filed on 05 September 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No. _____.
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892) | 5 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6 <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No. _____ |
| 3 <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No. _____ | 7 <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9 <input type="checkbox"/> Other |

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Dennis Stenzel, attorney of record, on 1/27/04.

The application has been amended as follows:

Claim 1 is amended to reflect intermixing of feed and permeate streams to distinguish the invention from the prior arts. The complete list of claims with amended claim 1 is given below:

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Complete List of Claims

1. (twice amended) A device for the simultaneous separation of particles and at least one target substance from a particle-laden liquid feed comprising:
 - (a) a housing having a liquid feed inlet and a permeate outlet for the discharge of permeate that is substantially free of said at least one target substance; and
 - (b) at least two adjacent porous adsorption membrane layers sealed fluid-tight in their peripheries and spaced apart from each other and having at least one aperture in each layer, with each aperture sized to be smaller than 100 times the diameter of the largest particles in the feed, so as to permit ~~and permitting~~ intermixing of (i) the passage of particles present in a liquid feed containing particles and said at least one target substance and (ii) said permeate [;]

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wherein said adsorption membrane layers carry at least one binding group capable of binding at least one of said at least one target substance, said binding group being selected from the group consisting of a functional group, a ligand and an ion exchange site.

2. (canceled)

3. (original) The device of claim 1 including at least one spacer between said at least two adjacent membrane layers.

4. (original) The device of claim 3 wherein said adjacent membrane layers are substantially parallel to each other.

5. (original) The device of claim 4 wherein said adjacent membrane layers are separated from each other by a distance of from about 0.1 to 5 mm.

6. (original) The device of claim 5 wherein said distance is from about 0.2 to about 1.0 mm.

7. (original) The device of claim 3 wherein said at least one spacer comprises a material selected from the group consisting of a web, a mesh, a woven material and matting.

8. (original) The device of claim 1 wherein said at least one aperture in said at least two adjacent membrane layers are offset from each other.

9. (original) The device of claim 1 wherein said at least one aperture takes up an area of up to about 20% of the surface area of said at least two membrane layers.

10. (original) The device of claim 9 wherein said area is from about 2 to about 4%.
11. (original) The device of claim 1 wherein the shape of said at least one aperture is selected from a slot and a circle.
12. (original) The device of claim 11 wherein said at least one aperture is in the shape of a circle and its diameter is from about 0.01 to about 20 mm.
13. (original) The device of claim 12 wherein said diameter is from about 0.5 to about 2 mm.
14. (original) The device of claim 1 wherein said membrane layers are spiral wound.
15. (original) The device of claim 14 wherein said membrane layers are enclosed within a module.
16. (original) The device of claim 1 wherein said membrane layers have a pore diameter ranging from about 0.1 to about 10 μm .
17. (original) The device of claim 16 wherein said pore diameter is from about 3 to about 5 μm .

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Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: The closest prior art is Onishi et al (US 5,244,578), which teaches a device for separating particles from a liquid feed and having inlets and outlets, adjacent porous adsorption membrane

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layers having functional groups, and the layers having apertures. However, the structure of Onishi is such that the apertures do not allow intermixing of feed and permeate streams, as in the claimed invention. It would also be not obvious to one of ordinary skill in the art to modify Onishi because Onishi device affects separation of particles from the liquid feed by membrane filtration process unlike the separation of just the target substances by adsorption on functional groups or ligands as claimed in the instant claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Krishnan Menon
Patent Examiner


W. L. WALKER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700